

progeny, 7 resemble the hybrid and 12 resemble the parental species, this is not strong evidence for monogenic control of the trait being considered, even though the numbers obtained do not differ significantly from a 1:1 ratio. Similarly, an observed genetic correlation between two traits of -0.29 ± 0.28 , which is not significantly different from zero, does not necessarily mean that the correlation is actually zero and that the two traits can evolve independently.

Despite these complaints, this collection should be perused by evolutionary biologists who are interested in any aspect of behavior. Those who do are likely to find that one of the variety of approaches employed by the contributors, from mosaic analysis to quantitative genetics, may be particularly suitable for studies of their own favorite organisms.—*John Jaenike, Department of Biology, University of Rochester, Rochester, New York 14627.*

LITERATURE CITED

Mayr, E. 1963. *Animal Species and Evolution*. Harvard University Press, Cambridge, Massachusetts.

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Perspectives in Chemoreception and Behavior.—R. F. Chapman, E. A. Bernays and J. G. Stoffolano, Jr. (eds.). 1987. Springer-Verlag, New York, New York, 206 pp. \$59.00.

Vincent Dethier is well known as one of the foremost investigators in the area of insect behavior and chemoreception. This volume is the result of a symposium held in honor of his 70th birthday, at the University of Massachusetts, Amherst, in May 1985. Papers by his colleagues and collaborators address the diverse areas of investigation to which Dr. Dethier has made fundamental contributions during his career.

L. M. Schoonhoven's chapter describes the chemosensory equipment of caterpillars and provides a comprehensive, current review of the search for an understanding of the sensory code, which translates the responses of a caterpillar's small number of chemoreceptors into host-specific feeding behaviors. F. E. Hanson describes the structure and neurophysiology of the contact chemosensory hair of muscoid flies (*Phormia* spp. and *Calliphora* spp.). Hanson's chapter emphasizes current theories of the mechanisms of taste stimulation for the four dendrites found in the hair and also includes speculation about a sensory code in these flies. T. Jermy provides a brief, clear review of our knowledge of feeding preference induction, oviposition preference induction, sensory and CNS-based habituation and food aversion learning in phytophagous insects. A short chapter by A. Gelperin contributes to this theme with interesting recent information on associative learning in the blowfly (*Phormia*), and the methods of its investigation.

Other chapters on insect/plant interaction include D. Schneider's description of the fascinating physiological and ecological relationships between certain danoids and arctiids and the pyrrolizidine alkaloids of their host plants. R. F. Chapman and E. A. Bernays present a well developed argument for viewing the evolution of insect aversion to certain plant secondary compounds as driven by a variety of ecological

and physiological factors rather than just the toxicity of these compounds. They point out that the 'deterrent receptors' found in many insects are broadly sensitive to many compounds not normally encountered by these insects and that this leads to rejection of novel diets, whether or not this rejection is ecologically or physiologically adaptive. This chapter is particularly stimulating because it provides an evolutionary context for our knowledge about the insect chemical receptor system.

J. S. Kennedy describes Dethier's experimental search for the existence of 'motivation,' an elusive concept related to the endogenous factors influencing an animal's response to a stimulus. Dethier ultimately rejected the concept as only a metaphor for emergent properties of more complex CNS integration. Kennedy uses the discussion to issue a warning that 'mentalist' or teleological language is still prevalent in the behavioral sciences. He argues that such terms are misleading impediments to understanding behavioral mechanisms. Although this warning is an old one, it bears repeating.

M. Rothschild presents data and qualitative observations of oviposition by *Pieris brassicae* and offers a tenuous, and by her own acknowledgement speculative, adaptationist hypothesis for this complex behavior. Her interpretations are not convincing, but this chapter serves as a reminder, to those currently involved in similar research, of the difficulties in interpreting the complexities and variability of insect behavior.

There are two chapters (C. Pfaffmann and L. M. Beidler), on mechanisms of vertebrate gustation and one (E. Stellar) describing a method of quantifying appetitive motivation in the rat. Although their inclusion is consistent with the general theme of the book, they seem somewhat out of place in a work otherwise devoted to insects. A more general treatment of vertebrate chemosensory research, including conceptual links to insects, would have been appropriate in a volume likely to attract more entomologists than vertebrate physiologists. L. M. Beidler comes closest to such a synthesis by including a comparison of the response attributes of several vertebrate taste receptors and those of the blowfly.

The diversity of topics included in this book reflects the remarkable breadth of Dr. Dethier's influence on behavioral, physiological, and evolutionary biology. The breadth of this small volume, however, makes it somewhat disjointed, and few readers will find all of the book interesting. Another problem, common to symposium volumes, is that some of the material is dated. Although most of the chapters have been revised since their presentation as papers, few references (13, by my count) are more recent than 1985.

A charming aspect of the book is the admiration of the authors for Dr. Dethier's research and for his fascination with insect behavior. This admiration is reflected in the quality of the individual chapters and provides continuity to this tribute to his work.—*S. D. Eigenbrode, New York State Agricultural Experiment Station, Geneva, New York 14456.*

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The Natural History and Behavior of North American Beewolves.—H. E. Evans and K. M. O'Neill. 1988. Comstock Publishing Associates, Ithaca, New York, vii + 278 pp. Cloth \$45.00, paper \$23.50 U.S.